Open Research Online

The Open University's repository of research publications
and other research outputs

Developing a Framework for Mobile Assisted Language Learning through Learning Analytics for Self-Regulated Learning

Conference or Workshop Item

How to cite:

Viberg, Olga; Wasson, Barbara and Kukulska-Hulme, Agnes (2021). Developing a Framework for Mobile Assisted Language Learning through Learning Analytics for Self-Regulated Learning. In: Companion Proceedings 10th International Conference on Learning Analytics & Knowledge (LAK21), Society for Learning Analytics Research (SoLAR).

For guidance on citations see FAQs.

© 2021 Olga Viberg; 2021 Barbara Wasson; 2021 Agnes Kukulska-Hulme

https://creativecommons.org/licenses/by-nc-nd/4.0/

Version: Version of Record

Link(s) to article on publisher's website:
https://www.solaresearch.org/events/lak/lak21/

Copyright and Moral Rights for the articles on this site are retained by the individual authors and/or other copyright owners. For more information on Open Research Online's data policy on reuse of materials please consult the policies page.

oro.open.ac.uk

Developing a Framework for Mobile Assisted Language Learning through Learning Analytics for Self-Regulated Learning

Olga Viberg
KTH Royal Institute of Technology, Sweden
oviberg@kth.se

Barbara Wasson
University of Bergen, Norway
barbara.wasson@uib.no

Agnes Kukulska-Hulme
Open University, United Kingdom
agnes.kukulska-hulme@open.ac.uk

ABSTRACT: Mobile Assisted Language Learning through Learning Analytics (MALLAS) is a conceptual framework to aid learning designers in developing effective support for second- and foreign language (L2) learners through the application of learning analytics to facilitate self-regulated language learning across learning settings. Designing sound support mechanisms to develop adult L2 learners' ability to self-regulate their language learning process is important since many of them have limited opportunities to participate in language classes. MALLAS can be used to assist in design choices when developing theoretically underpinned mobile assisted language learning applications and/or services.

Keywords: Mobile assisted language learning, learning analytics, self-regulated learning, learning design, support mechanisms, framework

1 INTRODUCTION & BACKGROUND

Many adult second and foreign (L2) language learners need additional support to succeed in their second language acquisition (SLA) since a common hindrance for them is that they often have insufficient opportunities to participate in language classes or lack the ability to engage in language learning on their own (Viberg, Wasson, & Kukulska-Hulme, 2020). This can be explained by the fact that many are in full time jobs or enrolled in other education. We argue that such support should focus on the development of learners' self-regulated language learning strategies, skills and knowledge that are critical for learners' ability to acquire the target language successfully (Oxford, 2016). Furthermore, we also argue that we need to carefully consider recent advancements in the fields of mobile assisted language learning (MALL; e.g., Shadiev et al., 2019;) and learning analytics (LA) for self-regulated learning (Viberg, Khalil, & Baars, 2020; Winne, 2017). Whereas the developments in these areas are frequently recognized separately, there are few efforts to draw synergy from them. Since we cannot design and improve learning directly, but only through the provision of improved conditions for L2 learners to acquire the target language effectively, based on the synergies from the aforementioned fields we offer a conceptual framework, **M**obile **A**ssisted **L**earning through **L**earning **A**nalytics for **S**elf-Regulated Learning (**MALLAS**; Viberg, Wasson, &

Creative Commons License, Attribution - NonCommercial-NoDerivs 3.0 Unported (CC BY-NC-ND 3.0)

Kukulska-Hulme, 2020). MALLAS is primarily intended for learning designers to inform their design choices for mobile technology assisted support aimed at facilitating the acquisition of various language skills (e.g., speaking, and writing). This is in line with growing interest in aligning learning design and LA (Wasson & Kirschner, 2020). In the mobile learning field, such combined efforts have hitherto been rare (Pishtari et al., 2020), and we aim to fill this gap. Also, the framework contributes to the existing gap in the provision of relevant LA-grounded support mechanisms for developing learners' self-regulated learning (SRL; Viberg, Khalil, & Baars, 2020). MALLAS is grounded in the theoretical lens of SRL (Zimmerman, 1990), strategic self-regulated language learning (Oxford, 2016), contextual mobile learning (Lincke, 2020), and the practical lens of LA. In the next section, we briefly outline MALLAS.

2 MALLAS FRAMEWORK

MALLAS (Fig.1) is a framework that captures the dimensions of self-regulated language learning (SRLL) and LA that are necessary to support mobile assisted language learning (MALL). It is an analytical tool that can be used to operationalise MALL support in a learning context.

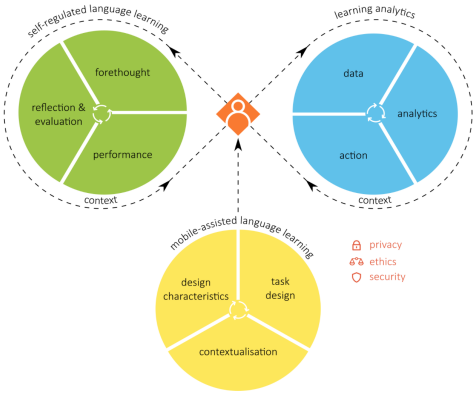

Figure 1: MALLAS

MALL has three key aspects: 1. mobile learning design characteristics, 2. contextualization, and 3. the design of language learning tasks. When developing relevant support, learning designers should consider the following design characteristics: the learner is mobile, the learner device is mobile, data services are persistent, the learning content is mobile, the learning tutor can be either an educator or an intelligent tutor (see Grant, 2019; Viberg, Wasson, & Kukulska-Hulme, 2020). **Contextualization is** grounded in the Rich Context Model (Lincke, 2020) that includes environment, device, and personal contexts, and a MALLAS app or service will have to take these into consideration both for the data collection and recommendation services that drive the adaptivity/personalisation of the learning app or service. Language learning **task design** is supported by the task phases (i.e., forethought, performance, evaluation and reflection (S2R model of Oxford, 2016)), suggesting that language learning tasks should closely align with these SRL phases. Since SRL strategies can be taught and learnt (Viberg, Khalil, & Baars, 2020), task design should include specific learning tasks aiming at fostering learners' SRL strategies (e.g., goal setting or time management), before they are applied to language learning. **Learning analytics** comprises *data*, *analytics*, and *action* (Fig. 1), which are used to measure and support the L2 learner's self-regulated MALL in context. Data ranges from personal (e.g., preferences) and demographic (e.g., age), location (e.g.,

Creative Commons License, Attribution - NonCommercial-NoDerivs 3.0 Unported (CC BY-NC-ND 3.0)

GPS), to activity data (e.g., click stream from using an app) and data about the learning device (e.g., iPhone). This multi-channel data is used to understand the learning context, the learning path/process (e.g., the learner has completed all the tasks), and can be used to take action to support learning (e.g., visualisation of what a learner knows/does not know), and to recommend a learning task. There are four main factors that will affect data quality: *richness* of the data set; *relevance* of the data; *diversity* and *quality* of the data, and *usefulness* of the findings generated by (context) analytics (Lincke, 2020). Decisions about whether to store data collected for LA locally on the learning device, or in a cloud service needs to consider privacy and security issues (for more see, Viberg, Wasson, & Kukulska-Hulme, 2020). Offering mixed-methods analyses, based on the theoretical lens of the S2R model (Oxford, 2016) and the examination of process-oriented behavioural data (e.g., contextual and multimodal data logs), as well as self-assessment generated data (e.g., instruments aiming to measure learners' motivation or level of self-regulation) will provide a deeper understanding of the complex nature of L2 learners' SRLL processes and how support them further. The data analysis drives the adaptivity of the MALLAS app (i.e., the software-initiated learning activities/behavioural actions) and the visualisations for the learner, educators, and researchers. The results of analytics should be used (i.e., *action)* to assist L2 learners, educators (who teach SRLL), and researchers (who help to develop relevant support tools). Overall, this poster exhibits this model of how we can harness the affordances of mobile language learning, learning analytics, and self-regulated learning to support L2 learners through LA for SRL across learning environments.

REFERENCES

Grant, M. (2019). Difficulties in defining mobile learning: analysis, design characteristics, and implications. *Educational Technology Research and Development, 67*(2), 361-388.

Lincke, A. (2020). *A Computational Approach for Modelling Context across Different Application Domains*. Doctoral Thesis. Växjö, Linnaeus University Press. 130.

Oxford, R. (2016). *Teaching and researching language learning strategies: Self-regulation in context.* Second Edition. Routledge.

Pishtari, F., Rodriguez-Triana, M., Sarmiento-Marques, E., Perez-Sanagustin, M., Ruiz-Calleja, A., Santos, P., Prieto, L., Serrano-Iglesias, S., & Väljataga, T. (2020). Learning design and learning analytics in mobile and ubiquitous learning: A systematic review. *British Journal of Educational Technology, 51*(4), 1078-1100. https://doi.org/10.1111/bjet.12944

Shadiev, R., Liu, T., & Hwang, W.-Y., (2019). Review of research on mobile-assisted language learning in familiar, authentic environments. *British Journal of Educational Technology, 51*(3), 709-720.

Viberg, O., Khalil, M., & Baars, M. (2020). Self-Regulated Learning and Learning Analytics in Online Learning Environments: A Review of Empirical Research. In Proceedings of the 10th International Conference on Learning Analytics and Knowledge (LAK20). https://doi.org/10.1145/3375462.3375483

Viberg, O., Wasson, B., & Kukulska-Hulme, A. (2020). Mobile assisted language learning through learning analytics for self-regulated learning (MALLAS): A conceptual framework. *Australasian Journal of Educational Technology.* https://doi.org/10.14742/ajet.6494

Wasson, B. & Kirschner, P. (2020). Learning design: European approaches. *TechTrends, 64,* 815-827. https://doi.org/10.1007/s11528-020-00498-0

Winne, P. (2017). Learning analytics for self-regulated learning. In C. Lang, G. Siemens, Wise, A., & D. Gašević (Eds.). *Handbook of Learning Analytics*, pp. 241-249.

Zimmerman, B. (1990). Self-regulated learning and academic achievement: an overview. *Educational Psychologist, 25*(1), 3-17.

Creative Commons License, Attribution - NonCommercial-NoDerivs 3.0 Unported (CC BY-NC-ND 3.0)